ABSTRACT

It is an object of the present invention to provide synthetic quartz glass optical materials suitable for use in YAG of higher order harmonics. The damage threshold value in J/cm^2 (energy density at which cracks occur generated by irradiation) is to be considered when synthetic quartz glass material is irradiated with YAG laser of third or higher order harmonics with single pulses or continuously. Regarding a synthetic quartz glass optical material in use for the optical parts constituting the prism and lens used in a laser beam machine, this invention provides a synthetic quartz glass material suitably used for the YAG laser with the third or higher order of harmonic, choosing the following conditions: OH group concentration is in the range of $\geqq 1$ to $\leqq 300$ppm; contained hydrogen molecule concentration is in the range of $\geqq 2\times10^{18}$ to $\leqq 2\times10^{19}$ molecules/cm^3; transmittance of ultraviolet rays at 245nm of wavelength is 99.9% or more; and the fictive temperature is in the range of $\geqq 880$ to $\leqq 990$℃.